

MMBT3904

Rev.G Jul.-2023

描述 / Descriptions

SOT-23 塑封封装 NPN 半导体三极管。Silicon NPN transistor in a SOT-23 Plastic Package.

特征 / Features

低电压，低电流，无卤产品。

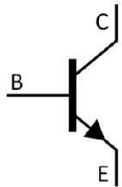
Low current, Low voltage, HF Product.

用途 / Applications

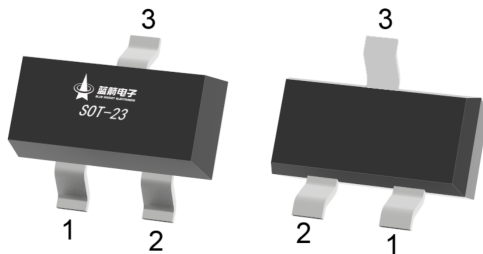
用于普通放大及开关。

General purpose amplifier and switching.

内部等效电路 / Equivalent Circuit



引脚排列 / Pinning



PIN 1 : Base

PIN 2 : Emitter

PIN 3 : Collector

放大及印章代码 / h_{FE} Classifications & Marking

h _{FE} Range	100~300
Marking	H1A

极限参数 / Absolute Maximum Ratings(Ta=25°C)

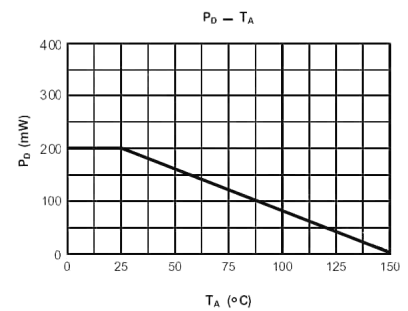
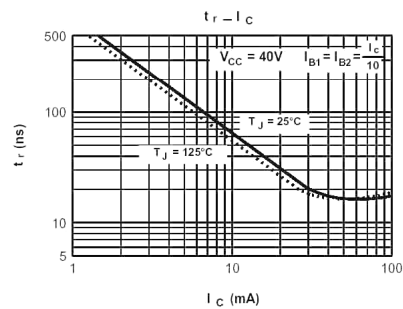
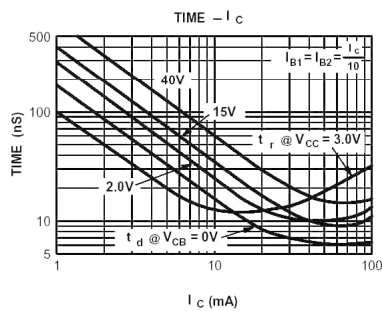
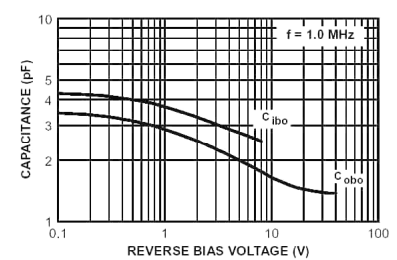
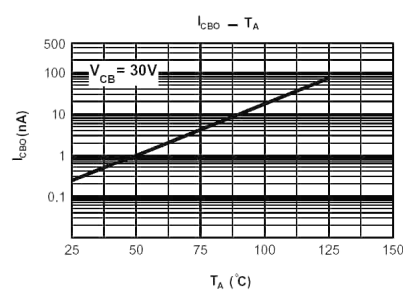
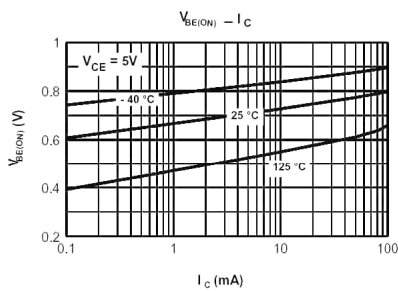
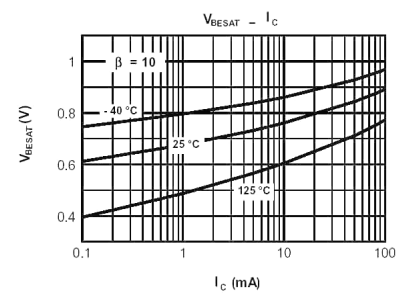
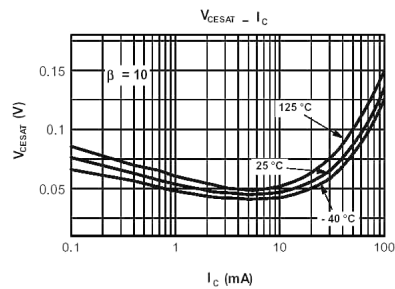
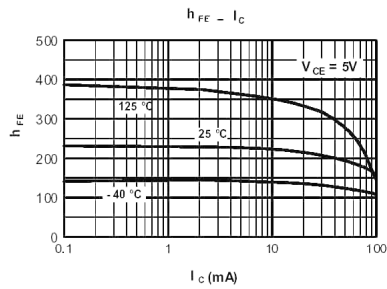
参数 Parameter	符号 Symbol	数值 Rating	单位 Unit
Collector to Base Voltage	V _{CBO}	60	V
Collector to Emitter Voltage	V _{CEO}	40	V
Emitter to Base Voltage	V _{EBO}	6.0	V
Collector Current	I _C	250	mA
Collector Power Dissipation	P _C	200	mW
	*P _C	350	mW
Junction Temperature	T _J	150	°C
Storage Temperature Range	T _{stg}	-55~150	°C

*在 7×5×0.6mm 陶瓷板上 *When mounted on a 7×5×0.6mm ceramic board

电性能参数 / Electrical Characteristics(Ta=25°C)

参数 Parameter	符号 Symbol	测试条件 Test Conditions	最小值 Min	典型值 Typ	最大值 Max	单位 Unit
Collector to Base Breakdown Voltage	V _{CBO}	I _C =10μA I _E =0	60			V
Collector to Emitter Breakdown Voltage	V _{CEO}	I _C =1.0mA I _B =0	40			V
Emitter to Base Breakdown Voltage	V _{EBO}	I _E =10μA I _C =0	6.0			V
Collector Cut-Off Current	I _{CBO}	V _{CB} =30V I _E =0			0.05	μA
Emitter Cut-Off Current	I _{EBO}	V _{EB} =3.0V I _C =0			0.05	μA
DC Current Gain	h _{FE(1)}	V _{CE} =1.0V I _C =10mA	100		300	
	h _{FE(2)}	V _{CE} =1.0V I _C =100mA	30			
	h _{FE(3)}	V _{CE} =1.0V I _C =50mA	60			
	h _{FE(4)}	V _{CE} =1.0V I _C =1.0mA	70			
	h _{FE(5)}	V _{CE} =1.0V I _C =0.1mA	40			
Collector-Emitter Saturation Voltage	V _{CE(sat)(1)}	I _C =10mA I _B =1.0mA			0.1	V
	V _{CE(sat)(2)}	I _C =50mA I _B =5.0mA			0.2	V
Base-Emitter Saturation Voltage	V _{BE(sat)(1)}	I _C =10mA I _B =1.0mA	0.65		0.85	V
	V _{BE(sat)(2)}	I _C =50mA I _B =5.0mA			0.95	V
Transition Frequency	f _T	V _{CE} =20V I _C =10mA f=100MHz	180			MHz
Output Capacitance	C _{ob}	V _{CB} =5.0V f=1.0MHz			4.0	pF
Storage Time	t _{stg}	V _{CC} =3.0V I _C =10mA I _{B1} =-I _{B2} =1.0mA			1200	ns
Fall Time	t _f	V _{CC} =3.0V I _C =10mA I _{B1} =-I _{B2} =1.0mA			250	ns
Delay Time	t _d	V _{CC} =3.0V V _{BE} =0.5V I _C =10mA I _{B1} =1.0mA			60	ns
Rise Time	t _r	V _{CC} =3.0V V _{BE} =0.5V I _C =10mA I _{B1} =1.0mA			80	ns
Input Capacitance	C _{ib}	V _{EB} =0.5V f=1.0MHz			12	pF

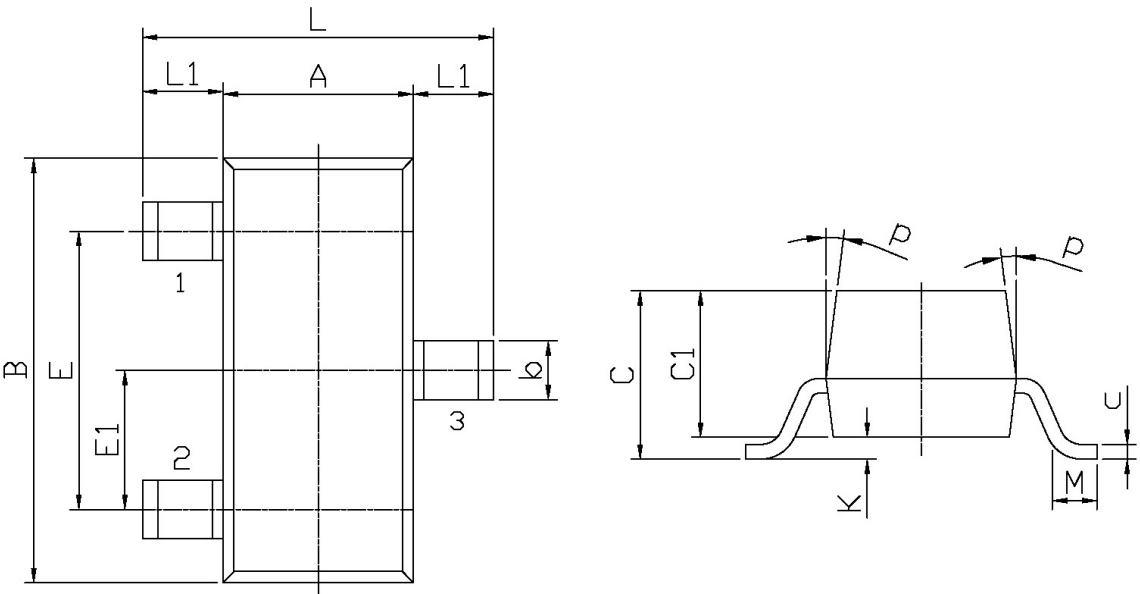
电参数曲线图 / Electrical Characteristic Curve



外形尺寸图 / Package Dimensions

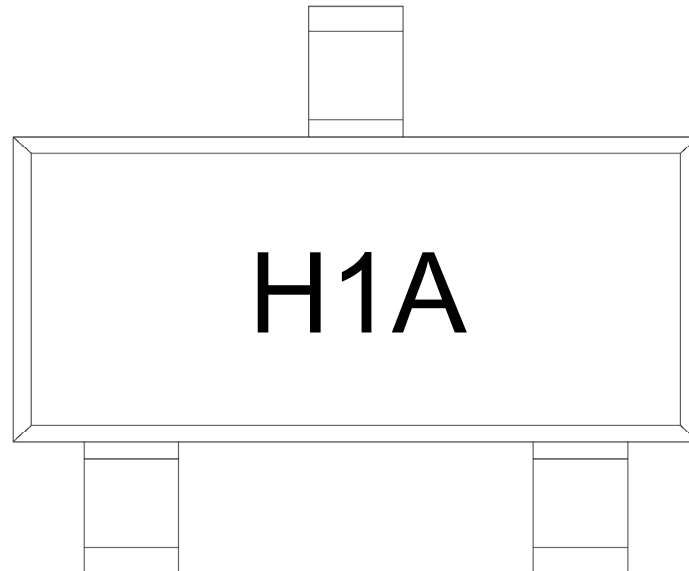
SOT-23

单位：mm



Symbol	Dimensions In Millimeters		Symbol	Dimensions In Millimeters	
	Min	Max		Min	Max
L	2.2	2.7	C	1.30Max	
L1	0.45	0.65	C1	0.90	1.20
A	1.15	1.50	c	0.05	0.20
B	2.70	3.10	K	0	0.10
E	1.70	2.10	M	0.20MIN	
E1	0.85	1.05	P	7°	
b	0.35	0.55			

印章说明 / Marking Instructions



说明：

H： 为公司代码

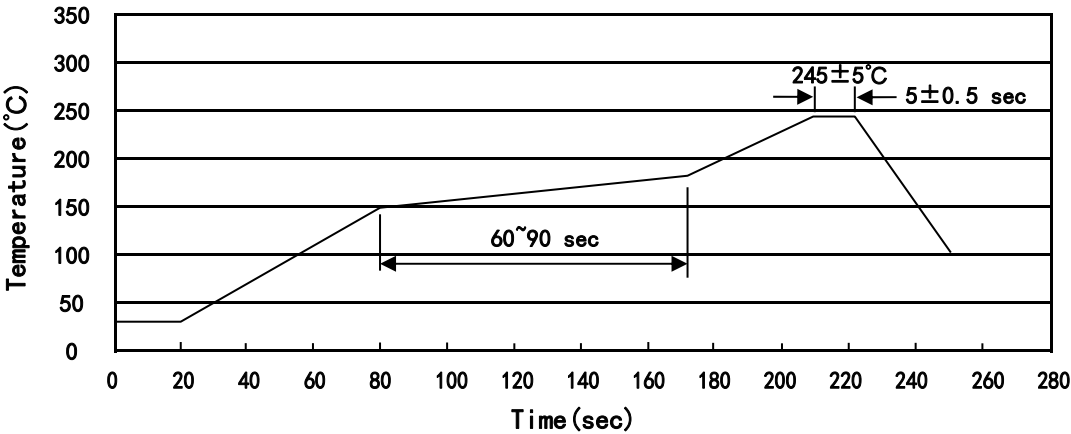
1A： 为型号代码

Note:

H： Company Code

1A： Product Type Code

回流焊温度曲线图(无铅) / Temperature Profile for IR Reflow Soldering(Pb-Free)



- 说明：

 - 1、预热温度 150 ~ 180℃，时间 60 ~ 90sec;
 - 2、峰值温度 245±5℃，时间持续为 5±0.5sec;
 - 3、焊接制程冷却速度为 2 ~ 10℃/sec.
- Note:

 - 1.Preheating:150~180℃, Time:60~90sec.
 - 2.Peak Temp.:245±5℃, Duration:5±0.5sec.
 3. Cooling Speed: 2~10℃/sec.

耐焊接热试验条件 / Resistance to Soldering Heat Test Conditions

温度：260±5℃ 时间：10±1 sec. Temp.:260±5℃ Time:10±1 sec

包装规格 / Packaging SPEC.

卷盘包装 / REEL

Package Type 封装形式	Units 包装数量					Dimension 包装尺寸 (unit: mm ³)		
	Units/Reel 只/卷盘	Reels/Inner Box 卷盘/盒	Units/Inner Box 只/盒	Inner Boxes/Outer Box 盒/箱	Units/Outer Box 只/箱	Reel	Inner Box 盒	Outer Box 箱
SOT-23	3,000	10	30,000	6	180,000	7" ×8	180×120×180	390×385×205

使用说明 / Notices